SEQUENCE LISTING

<110> Olandt, Peter J.
     Meyers, Rachel E.
     Galvin, Katherine A.
     Millennium Pharmaceuticals Inc.

<120> 33945, A Human Glycosyltransferase and
  Uses Therefor

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<151> 2001-02-15

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                       Met Trp Gly Arg Thr Ala Arg Arg Arg Cys Pro
                       1   5   10

cgg gaa ctg cgg cgc ggc cgg gag gcg ctg ttg gtg ctc ctg gcg cta   161
Arg Glu Leu Arg Arg Gly Arg Glu Ala Leu Leu Val Leu Leu Ala Leu
            15   20   25

ctg gcg ttg gcc ggg ctg ggc tcg gtg ctg cgg gcg cag cgt ggg gcc   209
Leu Ala Leu Ala Gly Leu Gly Ser Val Leu Arg Ala Gln Arg Gly Ala
          30   35   40

ggg gcc ggg gct gcc gag ccg gga ccc ccg cgc acc ccg cgc ccc ggg   257
Gly Ala Gly Ala Ala Glu Pro Gly Pro Pro Arg Thr Pro Arg Pro Gly
    45   50   55

cgg cgc gag ccg gtc atg ccg cgg ccg ccg gtg ccg gcg aac gcg ctg   305
Arg Arg Glu Pro Val Met Pro Arg Pro Pro Val Pro Ala Asn Ala Leu
 60   65   70   75

ggc gcg cgg ggc gag gcg gtg cgg ctg cag ctg cag ggc gag gag ctg   353
Gly Ala Arg Gly Glu Ala Val Arg Leu Gln Leu Gln Gly Glu Glu Leu
             80   85   90

cgg ctg cag gag gag agc gtg cgg ctg cac cag att aac atc tac ctc   401
Arg Leu Gln Glu Glu Ser Val Arg Leu His Gln Ile Asn Ile Tyr Leu
            95   100   105

agc gac cgc atc tca ctg cac cgc cgc ctg ccc gag cgc tgg aac ccg   449
Ser Asp Arg Ile Ser Leu His Arg Arg Leu Pro Glu Arg Trp Asn Pro

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ctg tgc aaa gag aag aaa tat gat tat gat aat ttg ccc agg aca tct    497
Leu Cys Lys Glu Lys Lys Tyr Asp Tyr Asp Asn Leu Pro Arg Thr Ser
    125                   130                 ·135

gtt atc ata gca ttt tat aat gaa gcc tgg tca act ctc ctt cgg aca    545
Val Ile Ile Ala Phe Tyr Asn Glu Ala Trp Ser Thr Leu Leu Arg Thr
140                   145                 150                     155

gtt tac agt gtc ctt gag aca tcc ccg gat atc ctg cta gaa gaa gtg    593
Val Tyr Ser Val Leu Glu Thr Ser Pro Asp Ile Leu Leu Glu Glu Val
                  160                 165                 170

atc ctt gta gat gac tac agt gat aga gag cac ctg aag gag cgc ttg    641
Ile Leu Val Asp Asp Tyr Ser Asp Arg Glu His Leu Lys Glu Arg Leu
                  175                 180                 185

gcc aat gag ctt tcg gga ctg ccc aag gtg cgc ctg atc cgc gcc aac    689
Ala Asn Glu Leu Ser Gly Leu Pro Lys Val Arg Leu Ile Arg Ala Asn
                  190                 195                 200

aag aga gag ggc ctg gtg cga gcc cgg ctg ctg ggg gcg tct gcg gcg    737
Lys Arg Glu Gly Leu Val Arg Ala Arg Leu Leu Gly Ala Ser Ala Ala
    205                   210                 215

agg ggc gat gtt ctg acc ttc ctg gac tgt cac tgt gag tgc cac gaa    785
Arg Gly Asp Val Leu Thr Phe Leu Asp Cys His Cys Glu Cys His Glu
220                   225                 230                     235

ggg tgg ctg gag ccg ctg ctg cag agg atc cat gaa gag gag tcg gca    833
Gly Trp Leu Glu Pro Leu Leu Gln Arg Ile His Glu Glu Glu Ser Ala
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gtg gtg tgc ccg gtg att gat gtg atc gac tgg aac acc ttc gaa tac    881
Val Val Cys Pro Val Ile Asp Val Ile Asp Trp Asn Thr Phe Glu Tyr·
                  255                 260                 265

ctg ggg aac tcc ggg gag ccc cag atc ggc ggt ttc gac tgg agg ctg    929
Leu Gly Asn Ser Gly Glu Pro Gln Ile Gly Gly Phe Asp Trp Arg Leu
    270                   275                 280

gtg ttc acg tgg cac aca gtt cct gag agg gag agg ata cgg atg caa    977
Val Phe Thr Trp His Thr Val Pro Glu Arg Glu Arg Ile Arg Met Gln
    285                   290                 295

tcc ccc gtc gat gtc atc agg tct cca aca atg gct ggt ggg ctg ttt    1025
Ser Pro Val Asp Val Ile Arg Ser Pro Thr Met Ala Gly Gly Leu Phe
300                   305                 310                     315

gct gtg agt aag aaa tat ttt gaa tat ctg ggg tct tat gat aca gga    1073
Ala Val Ser Lys Lys Tyr Phe Glu Tyr Leu Gly Ser Tyr Asp Thr Gly
                  320                 325                 330

atg gaa gtt tgg gga gga gaa aac ctc gaa ttt tcc ttt agg atc tgg    1121
Met Glu Val Trp Gly Gly Glu Asn Leu Glu Phe Ser Phe Arg Ile Trp
                  335                 340                 345

cag tgt ggt ggg gtt ctg gaa aca cac cca tgt tcc cat gtt ggc cat    1169
Gln Cys Gly Gly Val Leu Glu Thr His Pro Cys Ser His Val Gly His
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gtt ttc ccc aag caa gct ccc tac tcc cgc aac aag gct ctg gcc aac   1217
Val Phe Pro Lys Gln Ala Pro Tyr Ser Arg Asn Lys Ala Leu Ala Asn
    365               370               375

agt gtt cgt gca gct gaa gta tgg atg gat gaa ttt aaa gag ctc tac   1265
Ser Val Arg Ala Ala Glu Val Trp Met Asp Glu Phe Lys Glu Leu Tyr
380               385               390               395

tac cat cgc aac ccc cgt gcc cgc ttg gaa cct ttt ggg gat gtg aca   1313
Tyr His Arg Asn Pro Arg Ala Arg Leu Glu Pro Phe Gly Asp Val Thr
                  400               405               410

gag agg aag cag ctc cgg gac aag ctc cag tgt aaa gac ttc aag tgg   1361
Glu Arg Lys Gln Leu Arg Asp Lys Leu Gln Cys Lys Asp Phe Lys Trp
              415               420               425

ttc ttg gag act gtg tat cca gaa ctg cat gtg cct gag gac agg cct   1409
Phe Leu Glu Thr Val Tyr Pro Glu Leu His Val Pro Glu Asp Arg Pro
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ggc ttc ttc ggg atg ctc cag aac aaa gga cta aca gac tac tgc ttt   1457
Gly Phe Phe Gly Met Leu Gln Asn Lys Gly Leu Thr Asp Tyr Cys Phe
    445               450               455

gac tat aac cct ccc gat gaa aac cag att gtg gga cac cag gtc att   1505
Asp Tyr Asn Pro Pro Asp Glu Asn Gln Ile Val Gly His Gln Val Ile
460               465               470               475

ctg tac ctc tgt cat ggg atg ggc cag aat cag ttt ttc gag tac acg   1553
Leu Tyr Leu Cys His Gly Met Gly Gln Asn Gln Phe Phe Glu Tyr Thr
              480               485               490

tcc cag aaa gaa ata cgc tat aac acc cac cag cct gag ggc tgc att   1601
Ser Gln Lys Glu Ile Arg Tyr Asn Thr His Gln Pro Glu Gly Cys Ile
              495               500               505

gct gtg gaa gca gga atg gat acc ctt atc atg cat ctc tgc gaa gaa   1649
Ala Val Glu Ala Gly Met Asp Thr Leu Ile Met His Leu Cys Glu Glu
              510               515               520

act gcc cca gag aat cag aag ttc atc ttg cag gag gat gga tct tta   1697
Thr Ala Pro Glu Asn Gln Lys Phe Ile Leu Gln Glu Asp Gly Ser Leu
    525               530               535

ttt cac gaa cag tcc aag aaa tgt gtc cag gct gcg agg aag gag tcg   1745
Phe His Glu Gln Ser Lys Lys Cys Val Gln Ala Ala Arg Lys Glu Ser
540               545               550               555

agt gac agt ttc gtt cca ctc tta cga gac tgc acc aac tcg gat cat   1793
Ser Asp Ser Phe Val Pro Leu Leu Arg Asp Cys Thr Asn Ser Asp His
                  560               565               570

cag aaa tgg ttc ttc aaa gag cgc atg tta tga agcctcgtgt atcaaggagc  1846
Gln Lys Trp Phe Phe Lys Glu Arg Met Leu  *
              575               580

ccatcgaagg agactgtgga gccaggactc tgcccaacaa agacttagct aagcagtgac  1906
cagaacccac caaaaactag gctgcattgc tttgaagagg caatcatttt gccatttgtg  1966
aaagttgtgt tggatttagt aaaaatgtga ataagctttg tacttatttt gagaactttt  2026
taaatgttcc aaaatacccт attttcaaag ggtaatcgta agatgttaac ccttggtatt  2086
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tagaaaatta aaaccttata atattttct atcaarawrw awattttaca gtcgtgcctt 2146
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Leu Gly Ser Val Leu Arg Ala Gln Arg Gly Ala Gly Ala Gly Ala Ala
            35                  40                  45
Glu Pro Gly Pro Pro Arg Thr Pro Arg Pro Gly Arg Arg Glu Pro Val
        50                  55                  60
Met Pro Arg Pro Pro Val Pro Ala Asn Ala Leu Gly Ala Arg Gly Glu
65                  70                  75                  80
Ala Val Arg Leu Gln Leu Gln Gly Glu Glu Leu Arg Leu Gln Glu Glu
                85                  90                  95
Ser Val Arg Leu His Gln Ile Asn Ile Tyr Leu Ser Asp Arg Ile Ser
            100                 105                 110
Leu His Arg Arg Leu Pro Glu Arg Trp Asn Pro Leu Cys Lys Glu Lys
            115                 120                 125
Lys Tyr Asp Tyr Asp Asn Leu Pro Arg Thr Ser Val Ile Ile Ala Phe
        130                 135                 140
Tyr Asn Glu Ala Trp Ser Thr Leu Leu Arg Thr Val Tyr Ser Val Leu
145                 150                 155                 160
Glu Thr Ser Pro Asp Ile Leu Leu Glu Glu Val Ile Leu Val Asp Asp
                165                 170                 175
Tyr Ser Asp Arg Glu His Leu Lys Glu Arg Leu Ala Asn Glu Leu Ser
            180                 185                 190
Gly Leu Pro Lys Val Arg Leu Ile Arg Ala Asn Lys Arg Glu Gly Leu
            195                 200                 205
Val Arg Ala Arg Leu Leu Gly Ala Ser Ala Ala Arg Gly Asp Val Leu
        210                 215                 220
Thr Phe Leu Asp Cys His Cys Glu Cys His Glu Gly Trp Leu Glu Pro
225                 230                 235                 240
Leu Leu Gln Arg Ile His Glu Glu Glu Ser Ala Val Val Cys Pro Val
                245                 250                 255
Ile Asp Val Ile Asp Trp Asn Thr Phe Glu Tyr Leu Gly Asn Ser Gly
                260                 265                 270
Glu Pro Gln Ile Gly Gly Phe Asp Trp Arg Leu Val Phe Thr Trp His
            275                 280                 285
Thr Val Pro Glu Arg Glu Arg Ile Arg Met Gln Ser Pro Val Asp Val
        290                 295                 300
Ile Arg Ser Pro Thr Met Ala Gly Gly Leu Phe Ala Val Ser Lys Lys
305                 310                 315                 320
Tyr Phe Glu Tyr Leu Gly Ser Tyr Asp Thr Gly Met Glu Val Trp Gly
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                325                          330                          335
Gly Glu Asn Leu Glu Phe Ser Phe Arg Ile Trp Gln Cys Gly Gly Val
            340                          345                     350
Leu Glu Thr His Pro Cys Ser His Val Gly His Val Phe Pro Lys Gln
            355                          360                     365
Ala Pro Tyr Ser Arg Asn Lys Ala Leu Ala Asn Ser Val Arg Ala Ala
        370                          375                     380
Glu Val Trp Met Asp Glu Phe Lys Glu Leu Tyr Tyr His Arg Asn Pro
385                          390                          395                     400
Arg Ala Arg Leu Glu Pro Phe Gly Asp Val Thr Glu Arg Lys Gln Leu
                    405                          410                     415
Arg Asp Lys Leu Gln Cys Lys Asp Phe Lys Trp Phe Leu Glu Thr Val
                420                          425                     430
Tyr Pro Glu Leu His Val Pro Glu Asp Arg Pro Gly Phe Phe Gly Met
            435                          440                     445
Leu Gln Asn Lys Gly Leu Thr Asp Tyr Cys Phe Asp Tyr Asn Pro Pro
        450                          455                     460
Asp Glu Asn Gln Ile Val Gly His Gln Val Ile Leu Tyr Leu Cys His
465                          470                          475                     480
Gly Met Gly Gln Asn Gln Phe Phe Glu Tyr Thr Ser Gln Lys Glu Ile
                    485                          490                     495
Arg Tyr Asn Thr His Gln Pro Glu Gly Cys Ile Ala Val Glu Ala Gly
                500                          505                     510
Met Asp Thr Leu Ile Met His Leu Cys Glu Glu Thr Ala Pro Glu Asn
            515                          520                     525
Gln Lys Phe Ile Leu Gln Glu Asp Gly Ser Leu Phe His Glu Gln Ser
        530                          535                     540
Lys Lys Cys Val Gln Ala Ala Arg Lys Glu Ser Ser Asp Ser Phe Val
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ggc cgg gag gcg ctg ttg gtg ctc ctg gcg cta ctg gcg ttg gcc ggg       96
Gly Arg Glu Ala Leu Leu Val Leu Leu Ala Leu Leu Ala Leu Ala Gly
                20                       25                      30

ctg ggc tcg gtg ctg cgg gcg cag cgt ggg gcc ggg gcc ggg gct gcc      144
Leu Gly Ser Val Leu Arg Ala Gln Arg Gly Ala Gly Ala Gly Ala Ala
            35                       40                      45

gag ccg gga ccc ccg cgc acc ccg cgc ccc ggg cgg cgc gag ccg gtc      192
Glu Pro Gly Pro Pro Arg Thr Pro Arg Pro Gly Arg Arg Glu Pro Val
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atg ccg cgg ccg ccg gtg ccg gcg aac gcg ctg ggc gcg cgg ggc gag      240
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 65               70               75               80

gcg gtg cgg ctg cag ctg cag ggc gag gag ctg cgg ctg cag gag gag      288
Ala Val Arg Leu Gln Leu Gln Gly Glu Glu Leu Arg Leu Gln Glu Glu
              85               90               95

agc gtg cgg ctg cac cag att aac atc tac ctc agc gac cgc atc tca      336
Ser Val Arg Leu His Gln Ile Asn Ile Tyr Leu Ser Asp Arg Ile Ser
             100              105              110

ctg cac cgc cgc ctg ccc gag cgc tgg aac ccg ctg tgc aaa gag aag      384
Leu His Arg Arg Leu Pro Glu Arg Trp Asn Pro Leu Cys Lys Glu Lys
         115              120              125

aaa tat gat tat gat aat ttg ccc agg aca tct gtt atc ata gca ttt      432
Lys Tyr Asp Tyr Asp Asn Leu Pro Arg Thr Ser Val Ile Ile Ala Phe
     130              135              140

tat aat gaa gcc tgg tca act ctc ctt cgg aca gtt tac agt gtc ctt      480
Tyr Asn Glu Ala Trp Ser Thr Leu Leu Arg Thr Val Tyr Ser Val Leu
145              150              155              160

gag aca tcc ccg gat atc ctg cta gaa gaa gtg atc ctt gta gat gac      528
Glu Thr Ser Pro Asp Ile Leu Leu Glu Glu Val Ile Leu Val Asp Asp
             165              170              175

tac agt gat aga gag cac ctg aag gag cgc ttg gcc aat gag ctt tcg      576
Tyr Ser Asp Arg Glu His Leu Lys Glu Arg Leu Ala Asn Glu Leu Ser
             180              185              190

gga ctg ccc aag gtg cgc ctg atc cgc gcc aac aag aga gag ggc ctg      624
Gly Leu Pro Lys Val Arg Leu Ile Arg Ala Asn Lys Arg Glu Gly Leu
         195              200              205

gtg cga gcc cgg ctg ctg ggg gcg tct gcg gcg agg ggc gat gtt ctg      672
Val Arg Ala Arg Leu Leu Gly Ala Ser Ala Ala Arg Gly Asp Val Leu
     210              215              220

acc ttc ctg gac tgt cac tgt gag tgc cac gaa ggg tgg ctg gag ccg      720
Thr Phe Leu Asp Cys His Cys Glu Cys His Glu Gly Trp Leu Glu Pro
225              230              235              240

ctg ctg cag agg atc cat gaa gag gag tcg gca gtg gtg tgc ccg gtg      768
Leu Leu Gln Arg Ile His Glu Glu Glu Ser Ala Val Val Cys Pro Val
             245              250              255

att gat gtg atc gac tgg aac acc ttc gaa tac ctg ggg aac tcc ggg      816
Ile Asp Val Ile Asp Trp Asn Thr Phe Glu Tyr Leu Gly Asn Ser Gly
             260              265              270

gag ccc cag atc ggc ggt ttc gac tgg agg ctg gtg ttc acg tgg cac      864
Glu Pro Gln Ile Gly Gly Phe Asp Trp Arg Leu Val Phe Thr Trp His
         275              280              285

aca gtt cct gag agg gag agg ata cgg atg caa tcc ccc gtc gat gtc      912
Thr Val Pro Glu Arg Glu Arg Ile Arg Met Gln Ser Pro Val Asp Val
         290              295              300

atc agg tct cca aca atg gct ggt ggg ctg ttt gct gtg agt aag aaa      960
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      Ile Arg Ser Pro Thr Met Ala Gly Gly Leu Phe Ala Val Ser Lys Lys
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      tat ttt gaa tat ctg ggg tct tat gat aca gga atg gaa gtt tgg gga   1008
      Tyr Phe Glu Tyr Leu Gly Ser Tyr Asp Thr Gly Met Glu Val Trp Gly
                      325                 330             335

      gga gaa aac ctc gaa ttt tcc ttt agg atc tgg cag tgt ggt ggg gtt   1056
      Gly Glu Asn Leu Glu Phe Ser Phe Arg Ile Trp Gln Cys Gly Gly Val
                  340                 345             350

      ctg gaa aca cac cca tgt tcc cat gtt ggc cat gtt ttc ccc aag caa   1104
      Leu Glu Thr His Pro Cys Ser His Val Gly His Val Phe Pro Lys Gln
              355                 360             365

      gct ccc tac tcc cgc aac aag gct ctg gcc aac agt gtt cgt gca gct   1152
      Ala Pro Tyr Ser Arg Asn Lys Ala Leu Ala Asn Ser Val Arg Ala Ala
          370                 375             380

      gaa gta tgg atg gat gaa ttt aaa gag ctc tac tac cat cgc aac ccc   1200
      Glu Val Trp Met Asp Glu Phe Lys Glu Leu Tyr Tyr His Arg Asn Pro
      385             390                 395                 400

      cgt gcc cgc ttg gaa cct ttt ggg gat gtg aca gag agg aag cag ctc   1248
      Arg Ala Arg Leu Glu Pro Phe Gly Asp Val Thr Glu Arg Lys Gln Leu
                      405                 410             415

      cgg gac aag ctc cag tgt aaa gac ttc aag tgg ttc ttg gag act gtg   1296
      Arg Asp Lys Leu Gln Cys Lys Asp Phe Lys Trp Phe Leu Glu Thr Val
                  420                 425             430

      tat cca gaa ctg cat gtg cct gag gac agg cct ggc ttc ttc ggg atg   1344
      Tyr Pro Glu Leu His Val Pro Glu Asp Arg Pro Gly Phe Phe Gly Met
              435                 440             445

      ctc cag aac aaa gga cta aca gac tac tgc ttt gac tat aac cct ccc   1392
      Leu Gln Asn Lys Gly Leu Thr Asp Tyr Cys Phe Asp Tyr Asn Pro Pro
          450                 455                 460

      gat gaa aac cag att gtg gga cac cag gtc att ctg tac ctc tgt cat   1440
      Asp Glu Asn Gln Ile Val Gly His Gln Val Ile Leu Tyr Leu Cys His
      465                 470                 475                 480

      ggg atg ggc cag aat cag ttt ttc gag tac acg tcc cag aaa gaa ata   1488
      Gly Met Gly Gln Asn Gln Phe Phe Glu Tyr Thr Ser Gln Lys Glu Ile
                      485                 490                 495

      cgc tat aac acc cac cag cct gag ggc tgc att gct gtg gaa gca gga   1536
      Arg Tyr Asn Thr His Gln Pro Glu Gly Cys Ile Ala Val Glu Ala Gly
                  500                 505                 510

      atg gat acc ctt atc atg cat ctc tgc gaa gaa act gcc cca gag aat   1584
      Met Asp Thr Leu Ile Met His Leu Cys Glu Glu Thr Ala Pro Glu Asn
              515                 520                 525

      cag aag ttc atc ttg cag gag gat gga tct tta ttt cac gaa cag tcc   1632
      Gln Lys Phe Ile Leu Gln Glu Asp Gly Ser Leu Phe His Glu Gln Ser
          530                 535                 540

      aag aaa tgt gtc cag gct gcg agg aag gag tcg agt gac agt ttc gtt   1680
      Lys Lys Cys Val Gln Ala Ala Arg Lys Glu Ser Ser Asp Ser Phe Val
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cca ctc tta cga gac tgc acc aac tcg gat cat cag aaa tgg ttc ttc    1728
Pro Leu Leu Arg Asp Cys Thr Asn Ser Asp His Gln Lys Trp Phe Phe
            565                 570                 575

aaa gag cgc atg tta tga                                             1746
Lys Glu Arg Met Leu  *
            580
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Ile Val Val Asp Asp Gly Ser Glu Thr Asp Glu Thr Val Glu Ile Ala
            35                  40                  45
Glu Asp Tyr Leu Asp Glu Arg Ile Lys Glu Glu Asn Pro Arg Ile Ile
    50                  55                  60
Ile Val Ile Arg Leu Glu Glu Asn Ser Gln Gly Pro Ala Ala Ala Arg
65                  70                  75                  80
Asn Lys Gly Ile Arg Arg Ala Thr Gly Asp Ser Asp Tyr Ile Leu Phe
            85                  90                  95
Leu Asp Ala Asp Asp Ile Phe Thr Pro Asp Lys Leu Glu Lys Leu Ile
            100                 105                 110
Asp Tyr Ala Glu Ala Thr Asp Ala Ala Val Val Leu Gly Ala Ile Asp
    115                 120                 125
Ala Tyr Glu Tyr Ala Glu Gly Glu Ser Asn Leu Tyr Arg Ile Ala Arg
    130                 135                 140
Ala Asp Thr Glu Arg Ser Leu Phe Ala Gly Leu Leu Arg Lys Thr Gly
145                 150                 155                 160
Arg Leu Thr Gly Gly Leu Glu Leu Ser Phe Glu Ile Gly Ser Asn Ala
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Ile Tyr Arg Arg Glu Ala Phe Glu Glu Leu Phe
    180                 185
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Arg Ser Val Phe Val Ile Thr Ile Leu Val Asn Gly Asn Ser Gly Arg
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Cys Leu Asp Val Asn Ser Ser Ser Glu Ser Asp Gly Asn Gln Val Gln
            20                  25                  30
Leu Trp Asn Cys His Ser Asn Pro Gly Lys Asn Gln Lys Trp Ser Leu
            35                  40                  45
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Thr Tyr Asp Glu Ser Asp Gly Glu Ile Arg Ser Val Val Asn Asn Asp
    50                  55                  60
Lys Cys Leu Thr Val Asn Ala Asn Ser Pro Gly Ser Glu Val Lys Leu
65                  70                  75                  80
Tyr Gln Cys Asp Ser Ala Thr Ser Asp Asn Gln Lys Trp Glu Leu Asn
                85                  90                  95
Asn Asp Gly Leu Ile Gly Asn Lys Ile Leu Leu Asn Leu Val Asn Thr
               100                 105                 110
Gly Leu Val Leu Asp Val Lys Gly Ser Asp Thr Gln Asn Gly Thr Lys
           115                 120                 125
Leu Ile Leu Tyr Thr Cys Ser Gly Gly Arg Asn Gln Gln Trp Leu Pro
    130                 135                 140
Thr
145


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Val Asn Gly Asn Ser Glu Ser Lys Ser Asp Gly Asn Pro Val Gln Leu
            20                  25                  30
Trp Asp Cys His Gly Gly Gly Asn Gln Leu Trp Lys Leu Thr Tyr Asn
            35                  40                  45
Glu Ser Asp Gly Ala Ile Arg Ile Asn Ser Asp Leu Cys Leu Thr Val
    50                  55                  60
Asn Gly Thr Val Thr Leu Tyr Ser Cys Asp Gly Thr Asp Lys Gly Asn
65                  70                  75                  80
Asp Asn Gln Lys Trp Glu Val Asn Lys Asp Gly Thr Ile Arg Asn Pro
                85                  90                  95
Lys Asn Ser Lys Lys Gly Val Asp Ser Gly Leu Cys Leu Asp Val Lys
               100                 105                 110
Asp Gly Asn Lys Val Gln Leu Trp Thr Cys Asn Gly Ser Asp Ala Pro
           115                 120                 125
Asn Gln Lys Trp Ile Phe Glu
    130                 135


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 1               5                  10                  15
Thr Asp Pro Ile Arg Ser Pro Thr Met Ala Gly Gly Leu Phe Ala Ile
            20                  25                  30
Asn Lys Glu Tyr Phe Glu Glu Leu Gly Thr Tyr Asp Pro Gly Met Asp
            35                  40                  45
Ile Trp Gly Gly Glu Asn Leu Glu Leu Ser Phe Arg Val Trp Gln Cys
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```
               50                      55                      60
Gly Gly Arg Leu Glu Ile Val Pro Cys Ser His Val Gly His Val Phe
65                      70                      75                      80
Arg Lys Arg Ser Pro Tyr Thr Phe Pro Gly Lys Gly Ser Gly Lys Asp
                    85                      90                      95
Val Ile Ser Arg Asn Thr Val Arg Val Ala Glu Val Trp Met Asp Asp
                    100                     105                     110
Tyr Lys Glu Tyr Phe Tyr Lys His Asn Pro Gln Ala Arg Lys Val Arg
                    115                     120                     125
Asp Phe Gly Asp Ile Ser Glu Arg Lys Glu Leu Arg Glu Lys Leu Gln
     130                     135                     140
Cys Lys Ser Phe Lys Trp Tyr Leu Glu Asn Val Tyr Pro Asp Leu Tyr
145                     150                     155                     160
Val Pro Ala His Glu Pro
                    165


<210> 8
<211> 578
<212> PRT
<213> Mus musculus

<400> 8
Met Ala Val Arg Trp Thr Trp Ala Gly Lys Ser Cys Leu Leu Leu Ala
  1               5                      10                      15
Leu Leu Thr Leu Ala Tyr Ile Leu Val Glu Phe Ser Val Ser Thr Leu
                    20                      25                      30
Tyr Ala Ser Pro Gly Ala Gly Gly Ala Arg Glu Leu Gly Pro Arg Arg
          35                      40                      45
Leu Pro Asp Leu Asp Thr Arg Glu Glu Asp Leu Ser Gln Pro Leu Tyr
     50                      55                      60
Ile Lys Pro Pro Ala Asp Ser His Ala Leu Gly Glu Trp Gly Arg Ala
65                      70                      75                      80
Ser Lys Leu Gln Leu Asn Glu Gly Glu Leu Lys Gln Gln Glu Glu Leu
                    85                      90                      95
Ile Glu Arg Tyr Ala Ile Asn Ile Tyr Leu Ser Asp Arg Ile Ser Leu
                    100                     105                     110
His Arg His Ile Glu Asp Lys Arg Met Tyr Glu Cys Lys Ala Lys Lys
          115                     120                     125
Phe His Tyr Arg Ser Leu Pro Thr Thr Ser Val Ile Ile Ala Phe Tyr
     130                     135                     140
Asn Glu Ala Trp Ser Thr Leu Leu Arg Thr Ile His Ser Val Leu Glu
145                     150                     155                     160
Thr Ser Pro Ala Val Leu Leu Lys Glu Ile Ile Leu Val Asp Asp Leu
                    165                     170                     175
Ser Asp Arg Ile Tyr Leu Lys Ala Gln Leu Glu Thr Tyr Ile Ser Asn
                    180                     185                     190
Leu Glu Arg Val Arg Leu Ile Arg Thr Asn Lys Arg Glu Gly Leu Val
          195                     200                     205
Arg Ala Arg Leu Ile Gly Ala Thr Phe Ala Thr Gly Asp Val Leu Thr
     210                     215                     220
Phe Leu Asp Cys His Cys Glu Cys Asn Thr Gly Trp Leu Glu Pro Leu
225                     230                     235                     240
Leu Glu Arg Ile Ser Arg Asp Glu Thr Ala Ile Val Cys Pro Val Ile
                    245                     250                     255
Asp Thr Ile Asp Trp Asn Thr Phe Glu Phe Tyr Met Gln Thr Gly Glu
                    260                     265                     270
Pro Met Ile Gly Gly Phe Asp Trp Arg Leu Thr Phe Gln Trp His Ser
          275                     280                     285
Val Pro Lys His Glu Arg Asp Arg Arg Thr Ser Arg Ile Asp Pro Ile
     290                     295                     300
```

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Arg Ser Pro Thr Met Ala Gly Gly Leu Phe Ala Val Ser Lys Lys Tyr
305             310             315             320
Phe Gln Tyr Leu Gly Thr Tyr Asp Thr Gly Met Glu Val Trp Gly Gly
            325             330             335
Glu Asn Leu Glu Leu Ser Phe Arg Val Trp Gln Cys Gly Gly Lys Leu
            340             345             350
Glu Ile His Pro Cys Ser His Val Gly His Val Phe Pro Lys Arg Ala
            355             360             365
Pro Tyr Ala Arg Pro Asn Phe Leu Gln Asn Thr Ala Arg Ala Ala Glu
    370             375             380
Val Trp Met Asp Glu Tyr Lys Glu His Phe Tyr Asn Arg Asn Pro Pro
385             390             395             400
Ala Arg Lys Glu Ala Tyr Gly Asp Leu Ser Glu Arg Lys Leu Leu Arg
            405             410             415
Glu Arg Leu Lys Cys Lys Ser Phe Asp Trp Tyr Leu Lys Asn Val Phe
            420             425             430
Ser Asn Leu His Val Pro Glu Asp Arg Pro Gly Trp His Gly Ala Ile
            435             440             445
Arg Ser Met Gly Ile Ser Ser Glu Cys Leu Asp Tyr Asn Ala Pro Asp
    450             455             460
Asn Asn Pro Thr Gly Ala Asn Leu Ser Leu Phe Gly Cys His Gly Gln
465             470             475             480
Gly Gly Asn Gln Phe Phe Glu Tyr Thr Ser Asn Lys Glu Ile Arg Phe
            485             490             495
Asn Ser Val Thr Glu Leu Cys Ala Glu Val Pro Gln Gln Lys Asp Tyr
            500             505             510
Val Gly Met Gln Asn Cys Pro Lys Asp Gly Leu Pro Val Pro Val Asn
            515             520             525
Ile Ile Trp His Phe Lys Glu Asp Gly Thr Ile Phe His Pro His Thr
    530             535             540
Arg Leu Cys Leu Ser Ala Tyr Arg Thr Ala Glu Gly Arg Pro Ser Val
545             550             555             560
His Met Lys Thr Cys Asp Ala Leu Asp Lys Asn Gln Leu Trp Arg Phe
            565             570             575
Glu Lys
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<210> 9
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus

<221> VARIANT
<222> (1)...(22)
<223> Xaa = any amino acid

<400> 9
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Leu Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa
 1               5                   10                  15
Xaa Xaa Xaa Xaa Xaa Leu
            20
```

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